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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/996,676	11/30/2001	Hideo Hada	2001-1787A	4175

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EXAMINER

ASHTON, ROSEMARY E

ART UNIT	PAPER NUMBER
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1752

DATE MAILED: 07/18/2002

4

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/996,676

Applicant(s)

HADA ET AL.

Examiner

Rosemary E. Ashton

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 February 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

2. Claims 1-10 are rejected under 35 U.S.C. 102(e) as being anticipated by ~~Uetani et al~~
Uetani et al U.S. patent no. 6,383,713.

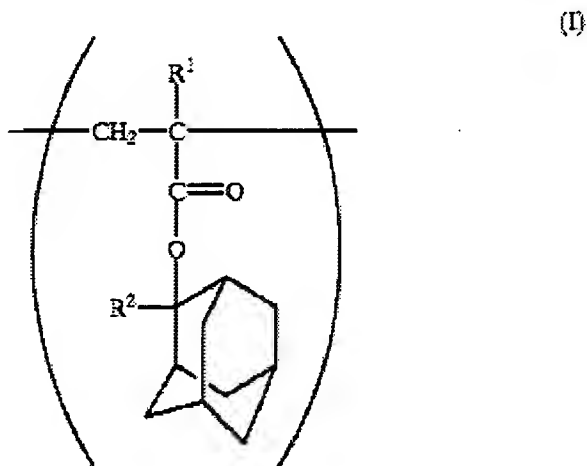
Uetani teaches a chemically amplified positive photoresist comprising a copolymer having the monomer units below that meet the limitations of claims 1-5 (col.2-4). In col. 4 lines 49-58 Uetani discloses:

The resin as a component of the resist composition of the present invention has 2-alkyl-2-adamantyl (meth)acrylate polymerization unit represented by the formula (I). In addition to this polymerization unit, the resin may optionally have 3-hydroxy-1-adamantyl (meth)acrylate polymerization unit represented by the formula (II) and/or .alpha.-(meth)acryloyloxy-.gamma.-butyrolactone polymerization unit represented by the formula (III), or .beta.-(meth)acryloyloxy-.gamma.-butyrolactone polymerization unit represented by the formula (IV).

Formula I corresponds to applicant's a1 in an amount of 20-80 mol%, Formula II corresponds to applicant's a3 in an amount of 20-70 mol% and Formula IV corresponds to applicant's a2 in an amount of 20-70 mol% (col. 7, lines 1-20). The amounts are in the range claimed by applicant.

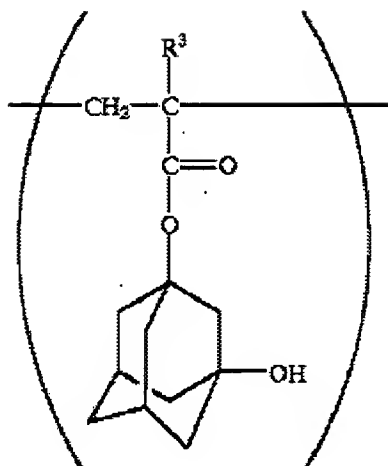
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Example Resin C in col. 12 has monomer units of formulas (I),(II) and formula (III) which is alpha.-(meth)acryloyloxy-gamma-butyrolactone in a ratio of 5:2.5:2.5. Assuming a total molar amount of 10 (5 + 2.5 + 2.5) the molar fraction of unit a1 is 50 mol%, a2 is 25 mol% and a3 is 25 mol % as in claims 5-7. While Uetani does not exemplify a copolymer of formulas (I), (II) and (IV) which is beta-(meth)acryloyloxy-gamma-butyrolactone one envisions using formula (IV) in the same amount because Uetani teaches this monomer unit may form a copolymer with formulas (I) and (II) and in the same amount as formula (III).

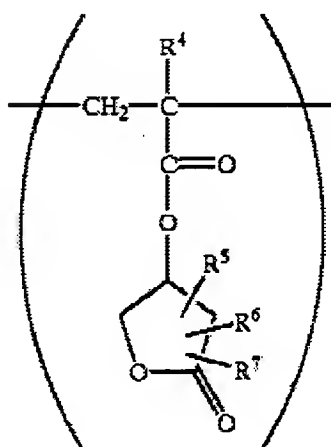


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(II)



(IV)



The photoacid generator is a sulfonium salt having a perfluoroalkylsulfonate anion as in claim 8 (abstract and col. 14, PAG1).

The amount of resin in the composition is 80 to 99.9 % by wt., the photoacid generator is in an amount of 0.1 to 20 % by wt. and the amine quencher is in an amount of 0.01 to 1 % by wt. as in claim 1 (col. 9, lines 43-52).

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As shown in Table 1 in col. 14 the solvent for the composition is a mixture of PGMEA and gamma butyrolactone in a 95:5 ratio as in claim 9.

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The quencher may be a secondary or tertiary aliphatic amine as shown by the teaching of lines 15-20, the piperidine derivatives in col. 9, line 25, which meet the limitation of claim 10.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Uetani cited above in view of Oomori et al U.S. patent no. 6,387,587.

As shown above Uetani teaches applicant's invention wherein the aromatic tertiary amine quencher diisopropyl aniline is exemplified, however, it does not teach the quencher is a trialkanolamine.

Oomori teaches a chemically amplified positive photoresist comprising a quencher wherein the quencher is an aliphatic secondary or tertiary amine, a tertiary alkanol amine (called a trialkanolamine by applicant) or an aromatic tertiary amine.

It would have been obvious to one of ordinary skill in the art to use a tertiary alkanol amine as the quencher in the invention of Uetani with a reasonable expectation of obtaining a chemically amplified positive photoresist having improved fidelity of the resist pattern because Oomori teaches an aromatic tertiary amine, such as exemplified in Uetani, is equivalent to a tertiary alkanol amine at limiting diffusion of the acid generated during exposure of the resist

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composition. It is well known in the art that limiting acid diffusion improves pattern resolution after processing the photoresist.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

In order to avoid cumulative rejections the examiner does not make a rejection over JP 2000347408, 12-2000 to Sato et al or Inoue et al U.S. patent no. 6,406,830.

Sato teaches a chemically amplified positive photoresist comprising a copolymer having the monomer units that meet the limitations of claims 1-5. Polymers 23 and 24 in section 181 meets the limitations of claims 1-5.

Inoue teaches a chemically amplified positive photoresist comprising a copolymer having the monomer units that meet the limitations of claims 1-5 as shown in col. 7-8, formulas III, IV and VI. The photoacid generator is an onium salt with a perfluoroalkylsulfonate anion.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rosemary E. Ashton whose telephone number is 308-2057. The examiner works a flexible work schedule and can normally be reached M-F between 10:00 am and 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Janet Baxter can be reached on 308-2303. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 308-0661.



Rosemary E. Ashton
Primary Examiner
Art Unit 1752

rea
July 9, 2002

**ROSEMARY ASHTON
PRIMARY EXAMINER**